

## Memorandum

DATE: January 19, 2004

FROM: Marc S. Greenberg, Ph.D.  
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TO: Doug Tomchuk,  
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RE: **ERT Review Of:** Preliminary Draft, Framework Document, Berry's Creek Study Area, Bergen County, New Jersey [dated December 2004].

Thank you for the opportunity to review the *Preliminary Draft, Framework Document, Berry's Creek Study Area, Bergen County, New Jersey*. If you have any questions on the comments below, please do not hesitate to call me at 732-452-6413.

### General Comments:

It may be a good idea to provide more justification for the sampling designs of the work plan elements. The overall sampling design, primarily outlined in Section 5 and on Table 5-1, is not presented so that we can understand the basis for the proposed sample sizes and locations. If the audience(s) of this document cannot clearly understand the justification for the study designs, then their buy-in will be difficult to obtain. These portions of the *Framework* would be improved with descriptions of the criteria, the types of sample designs considered (e.g., biased, random stratified, etc.), and any statistics that were used for choosing specifically identified locations and sample sizes (see Table 5-1) for, as an example, the sediment and surface water samples.

Regarding study designs, it would be useful to consider that there may be a need for flexibility such that sampling decisions will be made in the field. We understand this possibility and we suggest that a tool to support such field decisions that will manage uncertainty is the Triad Approach (see <http://clu.in.org/triad/#educ> and <http://www.triadcentral.org/>). The Triad Approach works by streamlining the sampling, analysis, and data management activities conducted during site assessment, characterization, and cleanup. It would be useful to incorporate relevance of this approach into the *Framework Document*.

The Rationale for the Study (Section 4.0) is a good starting point for the *Framework*, but it should be further developed. For example, in the descriptions of the DQO process there is no clear mention of the "identification of the decision", which is step #2 of the process. There is good development of the study questions, but no development of anticipated decision points. Presenting examples of anticipated decision points may be very helpful to the PRPs' understanding of the needs of EPA. There is also a need for improving the correspondence between the Phased objectives described in Sections 4.2-4.4, Table 4-1, and the details of the sampling program which are provided in Table 5-1.

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Soil and groundwater should be considered in the initial and final risk characterizations. In the introductory paragraph of Sec. 3.3 (p 3-10 to 3-11) and again in the risk assessment sections (e.g., Sec. 5.5.5) the stated intention to separately characterize the potential risks associated with soil and groundwater contamination "through other federal and state programs" may not be protective of either human or ecological receptors. These systems (i.e., soil and groundwater) are intimately connected with the creek/river and sediments. These connections will, in part, dictate the fate and transport of contaminants at the Site and thus exposure pathways. Acknowledgement that these connections exist and that their dynamic interactions should be understood is stated on page 3-12, but this statement is inconsistent with the intention summarized above. We recommend that soil and groundwater should be considered in the RI risk characterization. How any future potential risk management is conducted (i.e., through other programs) may be a better way of stating the intention.

We support the phasing of the work activities for the Berry's Creek Study. However, the timing of the ecological sampling program phases is not consistent with the Ecological Risk Assessment Process for Superfund. For example, the screening-level risk assessment (Steps 1 & 2) should be completed first (i.e., during Phase I) in order to make the decision that either the screening-level ecological risk assessment is adequate to determine that ecological threats are negligible, or the process should continue to a more detailed [baseline] ecological risk assessment (Steps 3 through 7). It would also be appropriate to develop the Step 3 Problem Formulation at the end of Phase I. This strategy of conducting Steps 1-3 in Phase I would ensure that remainder of the ecological sampling program design will be complete and will support decision-making at the site. Phase II of the Berry's Creek Workplan could then entail completing the baseline ecological risk assessment steps. Therefore, the ecological sampling of numerous (and expensive) program elements presently proposed to occur during Phase I should be moved to Phase II. These include: tissue samples of mummichogs, tissue samples of fiddler crabs, tissue samples of Phragmites, and verification of wetlands and ecosystems.

The *Framework Document* should specify that the product of the risk assessments will be risk-based clean-up levels. For example, in human health, these levels will span the  $10^{-4}$  to  $10^{-6}$  risk range for excess cancer risk. The development of risk-based clean-up levels at the end of the risk characterization will provide the site managers with important information that will be helpful in determining the final clean-up goals for the site. For ecological risks, we encourage the development of clean-up levels for each assessment endpoint. This will provide a range of ecologically protective, risk-based clean-up levels that can be used by the risk managers, in their application of the 9 criteria of the NCP, for the remedial decisions for the site.

#### **Specific Comments:**

- Sec. 3.1.2, p 3-5, last para: How was non-detect data treated in the cursory evaluation of historical data to estimate nature and extent of contamination. Please briefly describe.
- Sec. 3.1.2.1, p 3-6, para beneath the bullets: It would be a good idea to state what is meant by an exceedance of and ER-L or ER-M. Make it clear that these are ecological screening

values.

- Sec 3.1.2.3, p 3-8, 1<sup>st</sup> para: How was the subset of soils and groundwater data from applicable studies chosen? A brief description of the selection criteria would help to justify this.
- Sec 3.1.2.3, p 3-8, soils 2<sup>nd</sup> bullet: Please check to see if the Ambient Effects Threshold (AET) for arsenic was for sediments. We do not recommend using sediment screening levels to screen soils. The Oak Ridge benchmarks for earthworm toxicity and effects to microbial processes are 60 and 100 mg/kg, respectively. Plant MATCs for arsenic range from 4-105 mg/kg (Jacobs LW, Keeney DR, Walsh LM. Agron J 62, 588-591, 1970; Jiang QQ, Singh BR. Water Air Soil Pollut 74[3/4], 321-343, 1994).
- Sec 3.1.2.3, p 3-8, groundwater 1<sup>st</sup> bullet: Please either identify the AAWQC source directly, or use EPA's 2002 National Recommended Water Quality Criterion for Mercury of a CMC (acute) of 1.4 ug/L in freshwater or 1.8 ug/L in saltwater. These recommended values are protective of aquatic life.
- Sec 3.1.2.3, p 3-9, 1<sup>st</sup> complete bullet: The value 69 ug/L is equivalent to the EPA's 2002 National Recommended Water Quality Criterion for Arsenic CMC (acute) in saltwater for the protection of aquatic life.
- Sec 3.3.3.2, p 3-14, 1<sup>st</sup> para: The statement "a possible assessment endpoint is the overall functional health and quality of the Berry's Creek Study Area" will not be useful as an assessment endpoint because it is too broad. However, this statement is a good long-term management goal for the Study Area.
- Sec 3.3.3.2, p 3-14, 1<sup>st</sup> para: The last sentence beginning with "However, for the purposes..." should be rephrased. Receptors are either at the site, or are potentially at your site, and so you do not choose receptors (you observe them and/or their habitats). It is the potential or candidate assessment endpoints, and later measurement endpoints, that you select.
- Comments on Table 4-1 Detailed Study Questions:
  - Page 1 of 6, tasks associated with sub-topic 6: It may be useful to collect information on the groundwater/surface water interaction dynamics using piezometers. However, we could not find this task on Table 5-1.
  - Page 2 of 6, sub-topic 9: How important is pursuing atmospheric deposition in Phase I or Phase II? Do we expect to be able to separate out the atmospheric deposition signal from other point and non-point sources?
  - Page 2 of 6, tasks associated with sub-topic 12: Why is it important for decisions that we measure the depth of mixing using radionuclide measurements?
  - Page 5 of 6, broad topic G and associated subtopics/tasks:
    - The inventory to address this study question can be achieved through a well-designed and executed biological survey of the site.
    - We suggest that the term "keystone species" be removed from the

subtopic 34 and replaced with “functional species” or “functional group”. Stick to an assessment endpoint approach (i.e., look to see if any species or groups are missing from a given trophic level in the food chain).

- Page 6 of 6, broad topic H, sub-topic 39: This sub-topic may pose an insurmountable challenge. For example, it is unlikely that we can separate atmospheric mercury from nearby industries from any evaporative or volatilization processes associated with the site.
- Sec 5.1.1, p 5-1 and Table 5-1: Was there any statistical basis to the sampling designs? For example in the proposed low-resolution core sampling, what is the basis or justification of 15 core transects? Why were 10% and 5% (or 50, whichever is greater) chosen for the Cr/As/Hg speciation and PCB congener analyses, respectively?
- Sec 5.1.1, p 5-1 and Table 5-1: Issues regarding high-resolution cores:
  - The reasons for collecting the high-resolution cores are not clear as written in the text or described in the table.
  - Why do we care about the “historical load” or “geochronological history” of COPCs to Berry’s Creek? This rationale will not be a ‘winner’ with the PRPs upon review. They could argue that the estimates of sedimentation rates and mixing rates can be obtained via other less expensive means that does not involve that analysis of COPCs.
  - From the Table 5-1, it appears that with a minimum of 9 high-res cores, the apparent intent is to capture high-res cores along 5 RMs at 9 specific areas. Collecting only one high-res core in each area (i.e., n=1) may not be helpful. If there is an anticipation of using the data to characterize each area, as well as look at the spatial trend by river mile, there will be no accounting for within-area variability. Clarification of intent is needed.
- Sec 5.1.3, p 5-5: The storm event sampling should be mentioned in the text.
- Sec. 5.1.8, p 5-7, 1<sup>st</sup> para, 1<sup>st</sup> sentence: Consider editing the 1<sup>st</sup> sentence to “...to complete a screening-level and, if necessary, baseline ecological risk assessment.” This edit is suggested because it may be best to softened the text to this.
- Sec 5.2, p 5-9, Sample analysis and Data Validation: An important topic related to these analyses is the use of the data for the initial screens. It is always a good idea to reach an agreement among the parties on the screening values that will be used in the risk assessments. Having this agreement up front will ensure that appropriate analytical methods can be chosen (and described in the QAPP) that will provide limits of detection that will allow for useful screening of the data (i.e., it is not useful to screen with non-detects when DLs/RLs are higher than the screening concentrations that you are using). We prefer to have analytical limits that are below our selected screening benchmarks.
- Sec 5.2, p 5-10, 2<sup>nd</sup> bullet: It is not clear why PCBs cannot also be reported as total PCBs from the congener analysis.

- **Sec 5.4, p 5-12, 1<sup>st</sup> para, last sentence:** Change "...assist in measuring..." to "...assist in estimating..."
- **Sec 5.5.2, p 5-15, 2<sup>nd</sup> para, last sentence:** It is very unlikely that we will be able to account for possible synergism (or additive and antagonistic toxic effects) as such an endeavor is out of the scope of this risk assessment. We don't know enough about mixtures toxicity to be able to do this at a site as complex as Berry's creek. The sentence should be modified to something along the lines of "...which are designed to measure the effects of multiple stressors, document exposure- and concentration-effects relationships, and reduce uncertainties associated with risk characterization based on chemistry alone."
- **Sec 5.5.2.2, p 5-15, 1<sup>st</sup> para, 1<sup>st</sup> sentence:** Change this sentence to "Similar to the screening-level human health risk assessment, a screening-level ecological risk assessment indicates which chemicals and media may pose potential unacceptable risks."
- **Sec 5.5.5, Baseline Ecological Risk Assessment, bullets:** Add a 3<sup>rd</sup> bullet indicating that the BERA will provide ecologically risk-based clean-up levels. Please note that these are the protective levels that can be used in risk management decisions that, through the NCP, will determine the final clean-up goals.
- **Sec. 5.5.5.5, Risk Characterization:** We should have risk-based clean-up levels reported at the end of the risk characterization. Please note that these are the protective levels that can be used in risk management decisions that, through the NCP, will determine the final clean-up goals.